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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,136	11/18/2003	Jaishankar Moothedath Menon	ARC920030069US1	7019
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JOSEPH P. CURTIN, L.L.C. 1469 N.W. MORGAN LANE PORTLAND, OR 97229-5291			EXAMINER PEIKARI, BEHZAD	
			ART UNIT 2189	PAPER NUMBER
			MAIL DATE 09/03/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/716,136	Applicant(s) MENON ET AL.	
	Examiner B. James Peikari	Art Unit 2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
 4a) Of the above claim(s) 16-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/18/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-15 in the reply filed on October 19, 2007 is acknowledged. Applicant withdrew claim 15 along with claims 16-43 at that time.

In the amendment filed April 2, 2008, applicant has restored claim 15 as part of the same group as claims 1-14.

Drawings

2. The previous objection to the drawings is withdrawn due to the amendment filed April 2, 2008.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is unclear how a "disk sector" can be "received". Perhaps "generating" should replace "receiving"?

Because of the indefiniteness noted above, no art has been applied to claim 15.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi.

Regarding claim 1, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers greater than zero; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi did not explicitly mention that the sectors should be "disk sectors" (e.g., RAID parity sectors), it would have been obvious to one having ordinary skill in the art at the time the invention was made to keep the parity data or Servi in dedicated disk sectors (as opposed to "tracks" or "clusters" or "blocks") since (1) sectors were a well known disk partition size at the time of the invention (sectors are basically small sections of tracks) and (2) the Servi system utilized disks.

7. Claims 3, 8-9 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Kaneda et al. (US Patent 5,958,067), hereinafter simply Kaneda.

(A) Regarding claim 3, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 5 storage system. Kaneda teaches a method, wherein the RAID-configured storage system is configured as a RAID 5 storage system (column 1, lines 34-62). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Servi with Keneda. The motivation for doing so would have been an improved response performance and throughput (column 3, lines 51-56).

(B) Regarding claim 8, Keneda teaches a method, wherein the redundancy information is an XOR-based code (column 11, lines 6-23).

(C) Regarding claim 9, Keneda teaches a method, wherein the redundancy information is a one-dimensional parity (column 9, lines 24-33).

(D) Regarding claim 13, Keneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are written consecutively (Fig. 1, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are written consecutively).

(E) Regarding claim 14, Keneda teaches a method, wherein the n data information sectors and the c redundancy information sectors are intermingled when written (Fig. 5, Disk 301, Kaneda shows the Data Area 391 and Parity Area 392 are intermingled when written).

8. Claims 2, 4-7 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Servi et al. (US Patent Application 2004/0107400 A1), hereinafter simply Servi, in view of Hetzler et al. (US Patent Application 2005/0015700), hereinafter simply Hetzler.

(A) Regarding claim 2, Servi teaches a method for protecting data stored in a RAID-configured storage system from uncorrectable media errors, the RAID-configured storage system having a plurality of storage units, the method comprising:

associating n data information sectors (Fig. 1, D 1-10; paragraph 44) with c redundancy information sectors (Fig. 1, P 1-6; paragraphs 45, 46), the c redundancy information sectors being based on the n data information sectors, and n and c being integer value numbers; and

writing the n data information sectors with c redundancy information sectors on the same storage unit (paragraph 52, Servi discloses that data and parity set may be stored in different locations on the same storage medium).

Servi fails to teach the RAID-configured storage system is configured as a RAID 6 storage system. Hetzler teaches a method, wherein the RAID-configured storage

system is configured as a RAID 6 storage system (Paragraph 34). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Servi with Hetzler. The motivation for doing so would have been an improved performance, protection and efficiency (See Hetzler, paragraph 20).

(B) Regarding claim 4, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID 51 storage system (paragraph 35).

(C) Regarding claim 5, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID 3+3 storage system (paragraphs 27 and 30).

(D) Regarding claim 6, Hetzler et al. teach a method, wherein the RAID-configured storage system is configured as a RAID N+3 storage system (paragraph 34).

(E) Regarding claim 7, Hetzler et al. teach a method, wherein the redundancy information is based on a Reed-Solomon code (paragraph 21 and 31).

(F) Regarding claims 10, Hetzler et al. teach a method, wherein the storage unit is a hard disk drive (paragraph 27).

(G) Regarding claim 11, Hetzler et al. teach a method, wherein the storage unit is an optical drive (paragraph 27).

(H) Regarding claim 12, Hetzler et al. teach a method, wherein the storage unit is a random access memory (paragraph 27).

Response to Arguments

9. With regard to applicant's arguments included with the response filed on April 2, 2008, these have been carefully considered by the examiner but are not deemed to place the application in condition for allowance.

As stated in the previous Office action:

applicant's remarks are not commensurate in scope with the language of the claims. For example, in the case when $c=1$, any RAID system that has any parity in it whatsoever would teach claim 1; in the case where $n=c$, any RAID 5 or RAID 6 system would teach the claim 1; etc.

Applicant has not put any limitation on the scope of "n" and "c", except that they must be integers and must be greater than zero. Add that to the fact that the claims must be given their broadest reasonable interpretation, and then the examiner's statements find clear support.

Applicant has provided numerous detailed arguments as to why the above assertions are incorrect. However, these arguments fail to address the following critical statement from the previous Office action:

Also note that, as presently written, the claimed "storage unit" may include in its scope the entire RAID array.

With this statement in mind, the examiner's comment that when $c=1$, any RAID system that has any parity in it whatsoever would teach claim 1 is entirely correct.

Since applicant has not placed any limitation on what constitutes a “storage unit” in the claims, this feature must be given its broadest possible limitation, whereas applicant’s remarks appear to equate “storage unit” to a single disk and/or drive. Thus, applicant’s statement that “none of the RAID systems to which the Examiner refers writes the n data information disk sectors with c redundancy information disk sectors on the same storage unit” is not commensurate in scope with the claims.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2189

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).

/B. James Peikari/
Primary Examiner, Art Unit 2189
9/4/2008